



FEDERAL TRANSIT ADMINISTRATION



Transit Bus Technology Update

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Reason for Transit Interest in Electric Drive Technologies



- ◆ Need to Meet Emissions Standards
- ◆ Reduce Operating Cost
 - Fuel efficiency – fuel is 2nd largest operating cost
 - Current full size transit buses achieve only 3 – 4 mpg, less on some routes
 - Reduce maintenance costs
- ◆ Consumer Acceptance
 - Smoke and odor free
 - Clean and quiet



Why Transit Buses?



- ◆ **Fleet Operations**
 - Centrally fueled and maintained
 - Professional operators, mechanics, and fuelers
 - Urban stop-and-go duty cycle; fixed route & schedule
- ◆ **Size and Weight of Vehicle**
- ◆ **Federal Support for Capital Purchases**
 - Federal funding support
 - Programs to assist introduction of new technologies
- ◆ **High Visibility/High Impact**
 - Operate in densely populated areas
 - Broader public exposure and acceptance



Current Effort Characteristics



- ◆ Limited Discretionary Funding
 - Congressionally directed earmarks
 - Both in research and capital programs
- ◆ Void in Technology Development
- ◆ Significant Funding from Bus Capital Earmarks
 - \$13.4 Million in FY 03
 - \$16.2 Million in FY 04
- ◆ Limited Data Collection, Evaluation and Information Sharing



FTA Direction



- ◆ Develop Business Case with Transit Industry for Appropriate FTA Role
- ◆ Manage Earmarks, Channel into Cohesive Program
- ◆ Facilitate Data Collection, Evaluation and Information Sharing
- ◆ Leverage Resources to the Benefit of Transit



Business Case for FTA Role



- ◆ Data Collection and Evaluation
 - Greater coordination nationally and internationally
 - Continued coordination with DOE/NREL
- ◆ Accelerate the Commercialization of Hybrid Electric Buses
 - Ways to increase market volume
 - Exploring funding incentives
- ◆ Hybrid Electric Bus Certification
 - Engine vs vehicle based
 - Working group approach



Hydrogen & Fuel Cell Bus Program



- ◆ Heavy-Duty Fuel Cell Bus
 - Santa Clara VTA – Ballard, Gillig
 - AC Transit, SunLine Transit – UTC, Van Hool
 - CUTE Program
- ◆ Automotive-Based Fuel Cell Hybrid Bus
 - Hickam Air Force Base – Hydrogenics, Enova
 - Alabama Birmingham – Ballard, DaimlerChrysler
 - New Haven – TBD
 - Ann Arbor - TBD
- ◆ Hydrogen ICE Hybrid Bus
 - SunLine Transit – ISE Research
 - UniTrans – UC Davis



Data Collection, Evaluation, Information Sharing



- ◆ Fuel Cell Bus Working Group
- ◆ International Fuel Cell Bus Workshop
- ◆ European Fuel Cell Bus Scanning Tour
- ◆ Electric Drive Bus Program Review
- ◆ Outreach to FTA Regional Offices



Leveraging Resources



◆ Air Force

- Hickam Air Force fuel cell hybrid bus
- Heavy-duty hybrid system with Mack

◆ Army's National Automotive Center

- Synthetic diesel
- Fuel cell, hybrid electric technology

◆ Department of Energy

- Hydrogen, fuel cell, infrastructure
- International Partnership for the Hydrogen Economy
- Data collection and evaluation



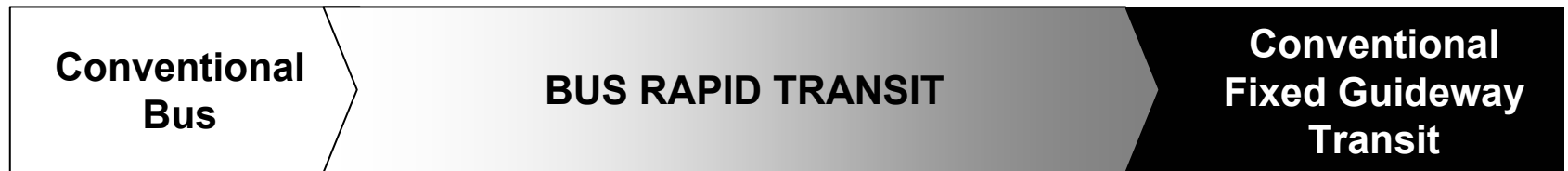
What is Bus Rapid Transit (BRT)?



- ◆ BRT is fast, reliable, convenient, affordable, accessible, and aesthetically distinguishable from “standard” bus service
- ◆ BRT may incorporate the following features:
 - Express service
 - Advanced Public Transportation Systems (APTS)
 - Off-board fare collection
 - Dedicated or exclusive rights-of-way
 - Improved vehicles



BRT is a Flexible & Integrated Package of Rubber-Tired Transit Solutions



BRT Components:

- Running Ways
- Stations
- Vehicles
- Services
- Route Structure
- Fare Collection
- Intelligent Transportation Systems (ITS)



Benefits of BRT?



◆ For Transit Users

- Improve services (frequency, reliability, access)
- Lower travel times (operating speed, wait times)
 - Time savings range from 29-32% on city streets to 47% on busways and reserved lanes

◆ For Transit Operators

- Increase ridership
 - U.S. BRT systems report 20-80% ridership increases
- Better utilization of resources
 - More economical to build than rail (BRT costs average \$.5-15M/mile)
 - Higher operating efficiency than conventional bus
- Allow incremental development and customization

◆ For the General Public

- Reduce congestion, emissions, and energy use
- Promote and reinforce positive land uses



Goals of FTA's BRT Initiative



- ◆ Demonstrate BRT as an Effective, Low Cost Transit Solution in Selected Corridors
- ◆ Provide Better Bus Service for Existing Riders
- ◆ Attract New Riders to Improved Bus Service
- ◆ Improve Transit Operational Efficiencies
- ◆ Leverage BRT to Introduce Technological Improvements into Revenue Service
- ◆ Change Perception that Bus Service is Slow, Inconvenient, & Uncomfortable
- ◆ Develop the *Characteristics of Bus Rapid Transit* (CBRT) Document to Guide Decision-Makers Interested in BRT as a Local Transit Option



Characteristics of BRT Document Will:



- ◆ Present BRT Information in an Easy to Use Format
- ◆ Provide Cost/Benefit Information to Help Support Business Case for BRT
- ◆ Develop a Consistent Framework for Assessing System Performance of BRT components
- ◆ Empower Planners with Tools to Make Investment Decisions that Best Respond to Local Needs
- ◆ Fully Incorporate BRT into the Larger Context of Transit System Planning



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